

2009 COSEE Educator Engagement Survey Results

Of the 1,982 individuals invited to take the Educator Engagement Survey, 904 responses were received for a 46% response rate (which is good for a survey of this kind). Of those respondents, 770 identified themselves as educator/teacher/etc., and that they had been involved with COSEE in 2009. We view this number as an educator baseline number for a single year.

Demographics

Educators involved with COSEE in 2009 are an accomplished group. The majority holds master's degrees (55%) and 8% had doctoral degrees. Fifty-three percent hold degrees in science or consider it their specialty. Of those who taught at the postsecondary level, 35% are tenured. The educators worked for schools, districts, agencies, institutions and others in 37 states and nine foreign countries.

Nearly two-thirds (64%) taught in or worked for a formal education setting, while 36% worked in or for informal education institutions. Those who worked directly with students/learners (n = 500) taught approximately 889,020 learners – preschoolers through adults – during 2009.

Most are mid-career professionals (40%), followed by early career (23%) and advanced career (18%). Eight percent identified themselves as volunteers. The majority of respondents are female (75%) and the racial background is predominantly white (86%).

Educators engaged with COSEE tend to do so over the course of several years: 40% of the educators have been involved with COSEE for at least three years. Most educators were engaged with COSEE as participants (89%). Sixty-six percent participated in person, 20% participated both in person and virtually, and 14% participated virtually only. In addition to being participants, educators provided resources (27%), were advocates/advisors (12%) and/or partners (13%), and 4% considered themselves leaders within COSEE. (*See full report for details regarding the categories.*)

Benefits and Impacts

From their engagement with COSEE, most educators gained resources (80%), a network of new colleagues (57%) and ongoing support from COSEE staff (45%).

Educators reported that they had, on average, gained two or three different opportunities as a result of engaging with COSEE. The number one opportunity educators cited that resulted from working with COSEE was the opportunity to learn from science researchers (80%). When asked how they engaged with scientists, 70% reported that they interacted with researchers in one or more ways. By far, the most common way was by learning about a scientist's research during a lecture or in the field (60%).

Educators reported that they had gained, on average, five skills/abilities as a result of working with COSEE. Most had a better understanding and knowledge about the ocean (72%) and new ocean content to teach or share (73%). Others gained a greater understanding of how science works (40%), confidence working with scientists (30%) and were better able to work with varied and diverse audiences (29%).

In terms of impact on their teaching settings, 40% indicated they had gained an ability to effect change in *how* science was taught where they teach, and 28% said they could influence what topics were taught.

This cross-Center survey has generated a set of reliable, consistent and coherent Network-wide data. We now have a baseline understanding of educators' involvement in COSEE during a single calendar year. We anticipate repeating this survey in the future to continue to track and improve the Networks' professional services and collaborations with the formal and informal science education community.

Survey Background

This survey was collaboratively developed and administered by the Evaluation Working Group (EWG), the COSEE Center PIs and evaluators, and the National Network Evaluation (NNE) team. Development of this survey was grounded in the “Bins” work of the EWG. At its core, it was designed to answer, with a high level of confidence, two key questions (which parallel the Scientist Engagement survey): 1) Who are the educators engaged with COSEE? and 2) How are they engaged?

In addition to these key questions, this survey also built on lessons learned and insights gained from the 2009 COSEE Scientist Engagement Survey, including ideas for additional data that could be gathered and more definite approaches to ensuring the data submitted from the Centers to the NNE for analysis was as clean and accurate as possible. Hence, this survey was longer than the Scientist Engagement Survey, had more questions related to the opportunities COSEE offers, what educators gain, and how educators use the new tools, knowledge and relationships they acquire from engaging with COSEE. Additionally, the survey had only one Tier II question (optional questions that Centers could choose to use as written).

Though some Centers submitted data for educators who were engaged with COSEE in previous years or in 2010, for purposes of consistency with the focus for reporting the Scientist Engagement Survey data, here we are reporting the 2009 Educator Engagement Survey data only.

Survey Administration and Response Rates¹

All COSEE Centers administered the survey in May 2010 and included a common set of 40 questions (Tier I questions). Eight Centers administered one additional question (Tier II) on cultural heritage. As with the Scientist Engagement Survey, Centers had the option to add Center-specific questions (Tier III) for their tailored purposes. The CCO did not administer this survey.

COSEE Centers collectively sent out 2,059 invitations to approximately 1,982 individuals (77 invitations were duplicate, that is, multiple Centers sent an invitation to an individual). We received 904 responses for a 46% response rate (which is good for this kind of survey). For an individual count of respondents for analysis, we reviewed the data and eliminated those not involved with COSEE in 2009, those we could not verify from survey data as educators/teachers (respondents are anonymous) and duplicates (individuals who responded to two or more Centers’ surveys). Of the 904 respondents, 770 (85%) individuals were identified as educators/teachers/etc., and had been involved in COSEE in 2009. Fifty COSEE staff responded, comprising 6% of the educator respondents.

HIGHLIGHTS OF RESULTS

(1) Who are the educators that engage with COSEE?

Educational Sector and Location

Educators engaged with COSEE are from diverse educational settings representing 37 states, with five surveys from countries other than the United States. Approximately half are formal K-12 educators, 12% college/university educators, and 36% are informal educators.

Three-fourths of those that are formal educators teach in, work in or work for preK-12 classrooms or schools, and 88% of them serve public schools. There were no tribal school or home-school responses.

¹ For full survey results and more detailed information about how these figures were generated, see the Survey Excel Workbook posted in the Evaluation Working Group folder on the COSEE filemanager.

The majority (43%) teaches in urban educational settings, about a third in suburban areas, a fifth in small cities, approximately 17% in rural communities, and 3% in online educational settings.

Educator Demographics

75% of educator respondents are female, 25% are male; for college/university educators, the percentages are closer to two-thirds female and one-third male.

Of the 685 respondents who indicated their own race or national origin, 86% are white; 6% of Latino, Hispanic or Spanish heritage; 4% Asian; 4% mixed/multiple race; 3% Black or African American, 2% American Indian or Alaska Native, and 3% indicated other. 3% declined to respond. Eight Centers opted to ask one additional question to gather more specific information about ethnicity and cultural heritage. Of the 461 educators who responded, 70% are of European descent; 4% indicated Native American and 3% each checked African, East Asian and Latin American. 1% each indicated Middle Eastern and Pacific Islands; 13% declined to respond and 10% checked other.

Educator Backgrounds

35% of the responding educators have secondary teaching credentials, 28% have an elementary (multiple subject) credential; 4% earned National Board certification. 31% of the educators have no certifications or credentials – these are primarily from the college/university, informal education and volunteer sectors.

The typical COSEE educator is best prepared in science, less well prepared in mathematics and technology, and least prepared in engineering. 53% of responding educators have a postsecondary degree in science or consider it their specialty; 16% indicate they have a lot of college training in science and 19% have some training. 12% have little or no training.

Career Stage, Tenure and Professional Roles

Those educators who were engaged in 2009 represent a spectrum of career stages: 5% are students, 23% are early career professionals, 40% are mid-career, 18% are advanced career professionals and 3% are retired; 8% classify themselves as volunteers. Of the college/university educators, 35% are tenured. The majority (69%) identify themselves as educators, teachers, instructors or faculty. The next most representative group includes principals, directors and administrators (12%) and volunteers (9%). One percent of respondents are education researchers and less than that are retired.

Education Leadership

Educators engaged with COSEE in 2009 are a highly educated group. 63% hold graduate degrees (55% Master's and 8% Ph.D.s). Additionally, a significant percentage of educators engaged with COSEE assume leadership roles at their institutions. 40% of all responding K-12 educators and 37% of responding college/university educators are engaged in leadership in their schools, districts and departments. At the K-12 level, the most common leadership roles are grade or school science lead teacher; department chair; mentor to beginning teachers; and curriculum chair or director. Other K-12 educators engage in a variety of other leadership roles such as MARE team leader; science fair and family science night coordinator, enrichment specialist/GATE teacher; site council member; and professional developer. At the college level, educators engage in leadership roles that include, among others, department chair, Associate Dean, director/coordinator of ocean science-related programs, and mentor to new faculty.

Given the long-term COSEE investment in work with educators, we think this is significant finding. COSEE tends to work with educators who in turn either work with other educators and/or have influence on curriculum, policy and/or program. As a result of engaging with COSEE, 40% indicated

they gained an ability to effect change in *how* science is taught in their teaching setting, and 28% say they can effect change in *what* is being taught in ocean science.

Teaching Science

Half of the 613 educators who indicated their instructional subjects/topics on the survey teach only science and/or technology. Many of the rest teach multiple subjects in self-contained classrooms (16%) or multiple topics in informal education settings (15%).

The science topics taught by the most educator respondents are Life/Biology (taught by 48% of educators), Marine/Aquatic Science (44%), and Environmental Science (42%). Following, Environmental, Ecology and Earth Sciences each are taught by around a third of the educators. Educators teaching Marine and Aquatic Science, Environmental Science and Ecology are mostly at informal institutions. For example 27% of the responding K-12 educators taught Marine or Aquatic Science in 2009, 44% of the college/university instructors did, and 76% of informal educators reported teaching these subjects.

Students and Learners

Most of the respondents (87%) work directly with students or other learners and they teach at all levels. Those in K-12 schools teach by grade levels—31% teach grades 3 to 5, 44% teach grades 6 to 8, and 42% teach grades 9 to 12. In informal settings, in addition to a high percentage teaching K-12 students, 62% teach adults and adult groups, 62% teach family groups, 47% teach other mixed-aged or multi-generational groups.

A total of 889,020 students and learners were reached by the 503 educators who reported this information for the year 2009. We cannot specifically trace COSEE-related or influenced content delivery via these educators, but the potential to reach a very large audience is significant for one year. The largest number of students and learners reached (801,441) was reported by the informal educators, half of whom worked on average with more than 1,000 learners in 2009. The K-12 educators taught a total of 55,935 students, with the typical (median) teacher working with 120 students. The college/university educators taught a total of 31,644 students, with the typical (median) instructor teaching 163 students.

We asked educators to estimate the race/ethnicity of the students they had taught in 2009 and the results are shown in the table below.

What was the racial/ethnic mix of your students or learners (in 2009)?

All Respondents (n = 481)	Median %	Range %
White	60	1 to 100
Black or African American	10	1 to 100
Asian	5	1 to 70
Native Hawaiian or other Pacific Islander	3	1 to 50
American Indian/Alaska Native	2	1 to 100
Other	12	1 to 100
Don't Know	10	1 to 100
Latino, Hispanic or Spanish heritage	10	1 to 100

(note: asked as a separate question)

(2) How do educators engage with COSEE?

Over Time

Educators engaged with COSEE tend to do so over the course of several years. We calculated that 30% of the respondents had been involved with COSEE for only one year, 40% of the educators have been involved with COSEE for at least three years and 14% have been involved five years or more. Many educators were involved in COSEE for multiple years beyond 2009 as follows: 2010 (70%), 2008 (58%), 2007 (36%), 2006 (27%), 2005 (18%), 2004 (12%), 2003 (9%), and 2002 (7%). An analysis by sector indicated more K-12 educators (37%) have been involved for only one year than the college/university or informal education sectors.

Participation

Not surprisingly, "participant" was the most frequent type of COSEE engagement for all types of educators. The great majority of educators (89%) were involved in COSEE as participants at COSEE's activities, programs and events. 27% made resources, facilities, and/or funds available in support of COSEE's efforts, and/or responded when asked for information, access to data, a presentation, a review, etc. 12% were advocates for or advisors to COSEE, and 13% were partners, working "shoulder-to-shoulder" with the COSEE Center to create new products or opportunities. 4% were involved in a leadership role at a COSEE Center.

Engagement with COSEE occurs in significant ways face-to-face and virtually. Two-thirds (66%) participated only in person in 2009, 20% participated both in person and through online formats, and 14% participated only online. (Twice as many college/university educators participated both in person and virtually as did the K-12 and informal educators.)

Educator-Science Researcher Connection

70% of responding educators report that they have engaged with science researchers in one or more ways as a result of working with COSEE. By far, the most common way is by learning about a scientist's research during a lecture or in the field (cited by 60%).

Fewer educators have worked with a scientist on developing teaching materials or activities (18%), participated in a citizen science project (16%), participated in a scientist's research (10%), had a scientist visit their classroom or work with their students (9%), and/or had a scientist work with the public at the beach or other informal education setting (9%).

Analyses of educator-scientist interactions by sector indicates K-12 educators were more likely than other educators to have a scientist visit their classroom or work with their students; college/university educators were more likely to work with a scientist on teaching materials or activities; and informal educators were more likely to participate in a citizen science project.

(3) What do educators gain from engagement with COSEE?

When asked what opportunities teachers/educators had had as a result of engaging with COSEE, respondents chose 2.7 on average out of the 6 choices offered. The number one opportunity was the opportunity to learn from science researchers (cited by 80%). The table below shows the other choices.

8. What opportunities have you had as a result of engaging with this COSEE?

	N	%
	759	

Opportunity to learn from science researchers	605	80%
Opportunity to work side-by-side with science researchers	279	37%
Opportunity to participate in real science inquiry (including research or citizen science activities)	321	42%
Opportunity to attend/ make a presentation at a professional science meeting	218	29%
Opportunity for new leadership role(s)	169	22%
Opportunity to make connections with other organizations, agencies or businesses	472	62%
None of the above	46	6%
<i>Average # of opportunities per educator</i>	2.7	

When asked how they engaged with scientists, 70% reported that they interacted with researchers in one or more ways. By far, the most common way was by learning about a scientist's research during a lecture or in the field (cited 60%). Fewer educators worked with scientists on developing teaching materials or activities (18%), participating in a Citizen Science project (16%), participating in a scientist's research (10%), having a scientist visit their classroom or work with their students (9%), or having a scientist work with the public at the beach/informal education setting (9%).

Educators reported that they had gained, on average, five skills/abilities as a result of working with COSEE. The top choices were: obtained new ocean content to teach or share (73%), a better understanding and knowledge about the ocean (72%), techniques for teaching about the ocean (62%) and techniques for getting other interested in the ocean (55%). Others gained a greater understanding of how science works (40%), confidence working with science researchers (30%) and ability to work with varied and diverse audiences (29%).

In terms of impact on their teaching settings, 40% indicated they had gained an ability to effect change in *how* science was taught where they teach, and 28% said they could effect change in what topics were taught at their home institution.

When asked what else they had gained from COSEE (asked by individual Centers), 80% indicated resources (teaching materials, websites, etc.), 57% gained a network of new colleagues, 45% had ongoing support from COSEE staff and ongoing support from research scientists (18%).

The survey asked what teachers had shared from COSEE with others (asked by individual Centers). Educators engaged with COSEE shared information/materials with their colleagues (81%) and or students/learners/volunteers/general public (72%). Almost half of the educators used COSEE information/materials in formal presentations and/or distributed them to colleagues (43%). Educators also presented information learned through COSEE at conferences or workshops (15%), posted COSEE materials on a website (15%), conducted COSEE in-service trainings/workshops at work (13%) and/or taught at a COSEE event (10%).

From this survey we have learned a great deal about a key audience and COSEE's impact. We anticipate repeating this survey in the future to continue to track and improve COSEE's professional services and collaborations with the ocean sciences formal and informal education community.